

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application.

Listing of Claims:

1 (Currently Amended). A fluid injection apparatus comprising:

~~at least one~~ a first drive mechanism and a second drive mechanism;

~~at least two~~ a first fluid containers container operably associated with the first ~~at least one~~ drive mechanism, ~~one~~ the first fluid container containing a first fluid; ~~contrast medium and the other fluid container containing a flushing medium; and~~

a second fluid container operably associated with the second drive mechanism, the second fluid container containing a second fluid; and

a control device operably associated with the ~~at least one drive mechanism~~ first and second drive mechanisms;

wherein said control device is operable to:

selectively program a plurality of phases of an injection procedure to be performed, ~~at least one phase~~ each of the phases capable of comprising ~~one of:~~ a contrast medium phase, a flushing medium phase, a pause phase ~~and~~ or a hold phase;

thereafter store aggregate information relating to the injection procedure as performed; and

avail an operator at a future time of the aggregate information relating to the performed injection procedure.

2 (Currently Amended). The apparatus according to Claim 1, wherein said control device is further operable to:

produce, during programming of the injection procedure, a graphical display indicating ~~at least~~ said plurality of phases; and

selectively recreate a facsimile of said graphical display at a subsequent time.

3 (Currently Amended). The apparatus according to Claim 2, wherein said control device is operable to recreate a facsimile of said graphical display ~~at least~~ at one of the following times: prior to an injection procedure, during an injection procedure ~~and~~ or immediately subsequent to an injection procedure.

4 (Original). The apparatus according to Claim 2, wherein said control device is operable to:
store a protocol comprising a plurality of phases;
store a graphical display corresponding to said protocol; and
recall the stored protocol, wherein a facsimile of the graphical display corresponding to the stored protocol is recreated.

5 (Currently Amended). The apparatus according to Claim 2, wherein said graphical display includes ~~at least one of: at least one screen display field corresponding to at least one phase; and at least one distinct color scheme associated with at least one~~ that said phase.

6 (Currently Amended). The apparatus according to Claim 1, wherein said control device is operable to store aggregate information relating to the injection procedure as performed, the aggregate information including ~~at least~~ quantitative information relating to said plurality of phases and to the occurrence of ~~at least one of: a scan delay and~~ or an inject delay.

7 (Currently Amended). A fluid injection apparatus comprising:
~~at least one~~ a first drive mechanism and a second drive mechanism;
~~at least two~~ a first fluid containers container operably associated with the first ~~at least one~~ drive mechanism, ~~one the first fluid container containing a first fluid; contrast medium and the other fluid container containing a flushing medium; and~~
a second fluid container operably associated with the second drive mechanism, the second fluid container containing a second fluid; and

a control device operably associated with the ~~at least one drive mechanism~~ first and second drive mechanisms;

wherein said control device is operable to selectively program a plurality of phases of an injection procedure;

~~at least one phase~~ each of the phases capable of comprising one of: a contrast medium phase ~~and~~ or a flushing medium phase; and

an arrangement for providing an internal stopwatch function.

8 (Original). The fluid injection apparatus according to Claim 7, wherein said arrangement for providing an internal stopwatch function is operable to measure the duration of contrast medium propagation towards determining a scan delay.

9 (Currently Amended). The fluid injection apparatus according to Claim 8 7, wherein ~~said~~ at least one of said plurality of phases ~~phase~~ comprises a hold phase.

10 (Original). The apparatus according to Claim 9, wherein the hold phase allows an operator to modify one or more injection parameters of a subsequent phase.

11 (Original). The apparatus according to Claim 9, wherein said control device further comprises a delay time clock, said control device further being operable to program the delay time clock during said hold phase.

12 (Original). The apparatus according to claim 9, wherein the hold phase is of indefinite duration.

13 (Original). The apparatus according to Claim 9, wherein KVO occurs during the hold phase.

14 (Original). The apparatus according to claim 7, wherein said arrangement for providing an internal stopwatch function is operable to alert an operator to imaging intervals in a dynamic imaging procedure.

15 (Original). The apparatus of Claim 7, wherein at least one of the two fluid containers comprises a syringe.

16 (Original). The apparatus according to Claim 7, wherein a first phase comprises a flushing medium phase and a second phase comprises a contrast medium phase.

17 (Original). The apparatus according to Claim 7, wherein each of the plurality of phases is defined by at least two injection parameters selected from fluid flow rate, fluid volume and injection duration.

18 (Original). The apparatus according to Claim 7, wherein each of the plurality of phases comprises at least one of a contrast medium phase, a flushing medium phase and a KVO phase.

19 (Currently Amended). A fluid injection apparatus comprising:

~~at least one~~ a first drive mechanism and a second drive mechanism;

~~at least two~~ a first fluid container operably associated with the first ~~at least one~~
drive mechanism, ~~one~~ the first fluid container containing a first fluid; ~~contrast medium and the~~
~~other fluid container containing a flushing medium; and~~

a second fluid container operably associated with the second drive mechanism, the second
fluid container containing a second fluid; and

a control device operably associated with the ~~at least one drive mechanism~~ first and
second drive mechanisms;

wherein said control device is operable to selectively program a plurality of phases of an injection procedure;

~~at least one phase~~ each of the phases capable of comprising one of: a contrast medium phase ~~and~~ or a flushing medium phase; and

~~at least one phase~~ one of said plurality of phases comprising a pause phase.

20 (Currently Amended). The apparatus according to Claim 19, wherein a first phase comprises ~~one of~~ a contrast medium phase ~~and~~ or a flushing medium phase, a second phase comprises ~~one of~~ a contrast medium phase ~~and~~ or a flushing medium phase and a third phase comprises said pause phase, wherein said pause phase is programmed to occur between the first and second phases.

21 (Original). The apparatus according to Claim 20, wherein the pause phase is programmable for a fixed duration of time.

22 (Original). The apparatus according to Claim 20, wherein the second phase automatically commences after the end of the pause phase.

23 (Original). The apparatus according to Claim 20, wherein the pause phase corresponds to an inject delay.

24 (Original). The apparatus according to Claim 20, wherein the pause phase corresponds to an inject delay in a procedure of successive multiple imaging.

25 (Original). The apparatus according to Claim 24, wherein the pause phase corresponds to an inject delay during which a patient table is movable between two locations for providing different patient images in a procedure of successive multiple imaging.

26 (Original). A method of programming an injector, comprising:

- providing an arrangement for providing an internal stopwatch function;

- programming a contrast medium phase;

- injecting the contrast medium;

- activating the arrangement for providing an internal stopwatch function to count time period increments upon initiating said injecting step;

- ascertaining the arrival of contrast medium at a predetermined location of the body of a patient;

- determining, with the arrangement for providing an internal stopwatch function, the elapsed time between initiation of said injecting step and the arrival of contrast medium at the predetermined location; and

- thereafter programming, for a subsequent injection of contrast medium, a delay period based on the elapsed time determined in said determining step.

27 (Original). The method according to Claim 26, wherein said ascertaining step comprises reviewing at least one image generated by an imaging device to determine the arrival of contrast medium at the predetermined location.

28 (Original). The method according to Claim 26, wherein the delay period programmed in said programming step comprises a scan delay.

29 (Original). The method according to Claim 26, wherein the delay period programmed in said programming step comprises an inject delay.

30 (Original). The method according to Claim 26, wherein the delay period programmed in said programming step is substantially equal to the elapsed time determined in said determining step.

31 (Currently Amended). A method of programming an injection procedure, comprising:

~~selectably~~ selectively programming a first phase of an injection procedure;

~~selectably~~ selectively programming a second phase of an injection procedure; and

programming a pause phase to occur between said first and second phases, wherein said pause phase corresponds to an inject delay.

32 (Currently Amended). A fluid injection apparatus comprising:

~~at least one~~ a first drive mechanism and a second drive mechanism;

~~at least two~~ a first fluid container ~~container~~ operably associated with the first ~~at least one~~ drive mechanism, ~~one~~ the first fluid container containing a first fluid; ~~contrast medium and the other fluid container containing a flushing medium; and~~

a second fluid container operably associated with the second drive mechanism, the second fluid container containing a second fluid; and

a control device operably associated with the ~~at least one drive mechanism~~ first and second drive mechanisms;

wherein said control device is operable to:

selectively program an injection procedure to be performed;

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thereafter store aggregate information relating to the injection procedure as performed, the aggregate information including ~~at least~~ quantitative information relating to ~~at least one of~~ a scan delay ~~and~~ or an inject delay; and

avail an operator at a future time of the aggregate information relating to the performed injection procedure.

33 (Original). The apparatus according to Claim 32, wherein said control device is further operable to:

produce, during programming of the injection procedure, a graphical display relating to the injection procedure; and

selectively recreate a facsimile of said graphical display at a subsequent time.

34 (Original). The apparatus according to Claim 33, wherein said control device is operable to recreate a facsimile of said graphical display ~~at least~~ at one of the following times: prior to an injection procedure, during an injection procedure and immediately subsequent to an injection procedure.

35 (Currently Amended). A fluid injection apparatus comprising:

~~at least one~~ a first drive mechanism and a second drive mechanism;

~~at least two~~ a first fluid container ~~container~~ operably associated with the first ~~at least one~~ drive mechanism, ~~one~~ the first fluid container containing a first fluid; ~~contrast medium and the other fluid container containing a flushing medium; and~~

a second fluid container operably associated with the second drive mechanism, the second fluid container containing a second fluid; and

a control device operably associated with the ~~at least one drive mechanism~~ first and second drive mechanisms;

wherein said control device is operably to selectively program an injection procedure comprising a pause phase, the pause phase corresponding to an inject delay.

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36 (Original). The apparatus according to Claim 35, wherein the pause phase corresponds to an inject delay in a procedure of successive multiple imaging.

37 (Original). The apparatus according to Claim 36, wherein the pause phase corresponds to an inject delay during which a patient table is movable between two locations for providing different patient images in a procedure of successive multiple imaging.

38 (New). The method according to Claim 26, wherein the delay period programmed in said programming step occurs during a hold phase.

39 (New). The method according to Claim 38, wherein said hold phase corresponds to an inject delay.

40 (New). The method according to Claim 38, wherein said hold phase corresponds to a scan delay.

41 (New). The method according to Claim 26, wherein the subsequent injection of a contrast medium in a subsequent injection phase is programmed based on said delay period through eliminating only the initial programming of said subsequent injection phase, and wherein said programming of the subsequent injection phase occurs in a hold phase.